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EXAMINER

NGUYEN, CHAU T

ART UNIT PAPER NUMBER

2176

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. Amendment, received on 04/07/2006, has been entered. Claims 1-2, 4-5, 9-15, and 30 are pending. Claims 3, 6-8, 16-29, and 31-34 are canceled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Independent claims 1, 30, dependent claims 4-5 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Games et al. (Games), U.S. Patent No 3,755,628 and further in view of Birkedahl et al. (Birkedahl), US Patent No. 5,778,203.

4. As to independent claims 1 and 30, Games discloses a network topology backplane bus architecture comprising:

a plurality of independent data communication lines (col. 3, lines 38-60 and Fig. 2: three channels designated A, B, and C);

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a plurality of processing nodes sharing the independent data communication lines for data communication (col. 3, lines 38-60 and Fig. 2: communication units J, K, L and M, and each unit links to three channels);

However, Games does not explicitly disclose four independent data communication lines, one or more of said processing nodes associated with a first enclosure being normally connected for transmitting on only a first and second of the data communication lines and being normally connected for receiving on all of the data communication lines, and one or more other processing nodes associated with a second enclosure being normally connected for transmitting on only a third and fourth of said data lines and being normally connected for receiving on all of said data lines. Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Birkedahl also discloses that processing nodes 12A and 12B, each associated with its own enclosure, connecting to only data communication lines 11A and 11C for transmitting, and connecting to data communication lines 11A, 11B and 11C for receiving, processing nodes 12C and 12D, each associated with its own enclosure, connecting to only data communication lines 11B and 11D for transmitting, and connecting to data communication lines 11A, 11B and 11D for receiving. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Birkedahl and Games to

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include four independent data communication lines, one or more of said processing nodes associated with a first enclosure being normally connected for transmitting on only a first and second of the data communication lines and being normally connected for receiving on all of the data communication lines, and one or more other processing nodes associated with a second enclosure being normally connected for transmitting on only a third and fourth of said data lines and being normally connected for receiving on all of said data lines. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract).

5. As to dependent claim 4, Games and Birkedahl (Games-Birkedahl) disclose wherein the processing nodes associated with the first enclosure utilize at least one of said first and second data communication lines for local communication with other nodes associated with the first enclosure (Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Birkedahl and Games to include the processing nodes associated with the first enclosure utilize at least one of said first and second data communication lines for local communication with other

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nodes associated with the first enclosure. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract).

6. As to dependent claim 5, Games-Birkedahl disclose wherein the processing nodes associated with the first enclosure utilize at least one of said first and second data communication lines for broadcasting transmissions to processing nodes associated with the second enclosure (Games, col. 5, line 24 – 6, line 67, and Fig. 3 and 5; and Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Birkedahl and Games to include the processing nodes associated with the first enclosure utilize at least one of said first and second data communication lines for broadcasting transmissions to processing nodes associated with the second enclosure. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract)).

7. As to dependent claim 9, Games-Birkedahl disclose wherein each of plurality of processing nodes associated with the first enclosure time-shares at least one of said first and second time communication lines with the other processing nodes associated with the first enclosure (Games, col. 4, line 57 – col. 5, line 23; and Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Birkedahl and Games to include each of plurality of processing nodes associated with the first enclosure time-shares at least one of said first and second time communication lines with the other processing nodes associated with the first enclosure. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract)).

8. As to dependent claim 10, Games-Birkedahl disclose wherein time-sharing said data communication lines is synchronized (Games, Abstract and col. 2, lines 14-41).

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9. As to dependent claim 11, Games-Birkedahl disclose wherein said processing nodes associated with the second enclosure utilize at least one of said third and fourth data communication lines for local communication with other nodes associated with the first enclosure (Games, col. 4, line 57 – col. 5, line 23; and Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Birkedahl and Games to include wherein said processing nodes associated with the second enclosure utilize at least one of said third and fourth data communication lines for local communication with other nodes associated with the first enclosure. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract)).

10. As to dependent claim 12, Games-Birkedahl disclose wherein said processing nodes associated with the second enclosure utilize at least one of said third and fourth data communication lines for broadcasting transmissions to processing nodes associated with the first enclosure (Games, col. 4, line 57 – col. 5, line 23; and Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C,

and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Birkedahl and Games to include wherein said processing nodes associated with the second enclosure utilize at least one of said third and fourth data communication lines for broadcasting transmissions to processing nodes associated with the first enclosure. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract)).

11. As to dependent claim 13, Games-Birkedahl disclose one of the processing nodes supports different ones of flight critical functions (Games, col. 3, lines 39-60).

12. As to dependent claim 14, Games-Birkedahl disclose one or more of the processing nodes supporting one of the flight critical functions is duplicated in one or more additional ones of the processing nodes (Games, col. 3, lines 39-60).

13. Dependent claims 2 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Games and Birkedahl as discussed in claims 1, 30, 4-5 and 9-14 above and further in view of Baker et al., U.S. Patent No. 5,325,517.

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14. As to dependent claim 2, however, Games and Birkedahl do not disclose wherein the first and third independent data communication lines comprise a first independent data communication network and the second and fourth independent data communication lines comprise a second independent data communication network. In the same field of endeavor, Baker discloses a prior art IBM System/88 module, plural modules interconnected by high speed data interconnections and plural modules interconnected via a network in a fault tolerant environment (col. 4, line 66 – col. 5, line 2, and col. 22, lines 11-67). Thus, it would have been obvious to one of the ordinary skill in the art at the time of the invention was made to combine the teaching of Games, Birkedahl and Baker to include the first and third independent data communication lines comprise a first independent data communication network and the second and fourth independent data communication lines comprise a second independent data communication network in order to share information.

15. As to dependent claim 15, Games-Birkedahl-Baker disclose one of the processing nodes supporting the one of the flight critical functions is located in the first enclosure; and at least one of the additional processing nodes supporting the one of the flight critical functions is located in the second enclosure (Baker, col. 5, lines 15-18, col. 18, line 66 – col. 19, line 33, col. 27, line 22 – col. 28, line 66, and col. 46, line 66 – col. 47, line 11 and Fig. 7-9, and Birkedahl, col. 6, lines 13-60 and Fig. 5: it could be desirable to separate the functional modules and concentrate the similar modules, for example, all the processor modules would reside in module unit 13X, all the I/O

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modules would reside in module unit 13Y, and all the database modules would reside in module unit 13Z. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Baker, Birkedahl and Baker to include one of the processing nodes supporting the one of the flight critical functions is located in the first enclosure; and at least one of the additional processing nodes supporting the one of the flight critical functions is located in the second enclosure since Birkedahl's system permits a large degree of flexibility in system design).

Response to Arguments

In the remarks, Applicant argued in substance that,

(a) The prior art, alone or in combination, fails to teach or suggest a network topology backplane bus architecture having four independent data communication lines, with one or more processing nodes associated with a first enclosure for transmitting on only a first and second of the four data communication lines and one or more other processing nodes associated with a second enclosure for transmitting on only a third and fourth of the data communication lines and all of the processing nodes being capable of receiving data on all of the data communication lines.

In reply to argument (a), Games discloses a plurality of independent data communication lines (Games, col. 3, lines 38-60 and Fig. 2: three channels designated A, B, and C); a plurality of processing nodes sharing the independent data

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communication lines for data communication (Games, col. 3, lines 38-60 and Fig. 2: communication units J, K, L and M, and each unit links to three channels);

However, Games does not explicitly disclose four independent data communication lines, one or more of said processing nodes associated with a first enclosure being normally connected for transmitting on only a first and second of the data communication lines and being normally connected for receiving on all of the data communication lines, and one or more other processing nodes associated with a second enclosure being normally connected for transmitting on only a third and fourth of said data lines and being normally connected for receiving on all of said data lines. Birkedahl discloses in the Abstract, col. 4, lines 6-29 and Figs. 1&2: module units 12A, 12B, 12C, and 12D (processing nodes) and these processing nodes each associated with an enclosure, and there are four independent data communication lines such as 11A and 11C (first and second data communication lines, respectively), 11B and 11D (third and fourth data communication lines, respectively). Birkedahl also discloses that processing nodes 12A and 12B, each associated with its own enclosure, connecting to only data communication lines 11A and 11C for transmitting, and connecting to data communication lines 11A, 11B and 11C for receiving, processing nodes 12C and 12D, each associated with its own enclosure, connecting to only data communication lines 11B and 11D for transmitting, and connecting to data communication lines 11A, 11B and 11D for receiving. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Birkedahl and Games to include four independent data communication lines, one or more of said processing

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nodes associated with a first enclosure being normally connected for transmitting on only a first and second of the data communication lines and being normally connected for receiving on all of the data communication lines, and one or more other processing nodes associated with a second enclosure being normally connected for transmitting on only a third and fourth of said data lines and being normally connected for receiving on all of said data lines. Birkedahl's system provides bus communication architecture that provides reliable and redundant data communication with a high bandwidth and also improves the safety and communications efficiency of the system (Birkedahl, Abstract).

16. Applicant's arguments filed 04/07/2006 have been fully considered but they are not persuasive. Please see the rejection and response to argument above.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chau Nguyen whose telephone number is (571) 272-4092. The examiner can normally be reached on 8:30 am – 5:30 pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Herndon, can be reached on (571) 272-4136. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. On July 15, 2005, the Central Facsimile (FAX) Number will change from 703-872-9306 to 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chau Nguyen
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